What is claimed is:

1. A method of forming a dielectric layer on a semiconductor device comprising:

providing a substrate having at least one semiconductor layer;

forming a first conductive layer over at least a portion of the substrate;

depositing a silicon-containing material from a silicon source over the first conductive layer;

forming the dielectric layer by processing the deposited silicon-containing material with a reactive agent selected to react with silicon atoms of the deposited silicon-containing material; and

forming a second conductive layer over the dielectric layer.

2. The method of claim 1, wherein the silicon source is silazane.

3. The method of claim 1, wherein the silicon-source is from the group comprising hexamethyldisilazane, tetramethyldisilazane, octamethylcyclotetrasilazine, hexamethylcyclotrisilazine, diethylaminotrimethylsilane and dimethylaminotrimethylsilane.

4. The method of claim 1, wherein the silicon source comprises a self limiting hexamethyldisilazane source.

5. The method of claim 1, wherein the reactive ambient is selected from the group comprising NH_3, N_2, O_2, O_3, N_20 and NO.

6. The method of claim 1, wherein the dielectric layer is primarily nitride.

7. The method of claim 1, wherein the dielectric layer is primarily oxide.

8. The method of claim 1, wherein the dielectric layer is about 45Å or less in thickness.

9. A method of forming a dielectric layer on a semiconductor device comprising:

providing a substrate having at least one semiconductor layer;

fabricating the semiconductor device proximate to the substrate;

vapor depositing a silicon-containing material from a silazane source over at least a portion of the semiconductor device; and

forming the dielectric layer by processing the silicon-containing material in a reactive ambient.

10. The method of claim 9, wherein vapor depositing a silicon-containing material from a silazane source over at least a portion of the semiconductor device is repeated at least once prior to forming the dielectric layer by processing the silicon-containing material in a reactive ambient.

11. The method of claim 9, wherein the reactive ambient is NH_3.

12. A method of forming a dielectric layer comprising:

providing a substrate having at least one semiconductor layer;

vapor depositing a silicon-containing material from a self limiting silicon source over at least a portion of the substrate; and

forming the dielectric layer by processing the silicon-containing material in a reactive ambient at a processing temperature, a processing time and a processing pressure selected

to result in a desired dielectric constant and leakage characteristics.

13. A method of fabricating a semiconductor device comprising:

providing a substrate having at least one semiconductor layer;

forming a conductive layer over at least a portion of the substrate;

forming at least one dielectric layer over the conductive layer, each formed by:

vapor depositing a silicon-containing material over the substrate; and

forming the dielectric layer by processing the silicon-containing material in a reactive ambient to cause silicon atoms of the deposited silicon-containing material to react with the reactive ambient; and

forming an electrode over the at least one dielectric layer.

14. The method of claim 13, wherein the electrode is comprised of a material selected from the group comprising metal, metal silicides and metal alloys.

15. The method of claim 13, wherein vapor depositing a silicon-containing material over the substrate is repeated at least once prior to forming the dielectric layer by processing the silicon-containing material in a reactive ambient.

16. The method of claim 13, wherein a composition the silicon-containing material of each dielectric layer of the at least one dielectric layer is primarily nitride.

17. The method of claim 13, wherein a composition the silicon-containing material of one layer of the at least one dielectric layer is different from at least one layer of the at least one dielectric layer.

18. The method of claim 13, wherein vapor depositing a silicon-containing material over the substrate comprises vapor priming a silicon-containing material over the substrate.

19. A method of fabricating a semiconductor device comprising:

providing a substrate having at least one semiconductor layer;

forming a conductive layer over the substrate;

vapor priming a first silicon-containing material over the gate oxide;

vapor priming a second silicon-containing material over the first silicon-containing material;

forming a silicon-containing dielectric layer having a thickness of about 20Å by processing the first silicon-containing material and the second silicon-containing material with a reactive agent selected to react with silicon atoms of the first silicon-containing material and the second silicon-containing material; and

forming a gate electrode over the silicon-containing dielectric layer.

20. The method of claim 19 further comprising:

doping the gate electrode with phosphor.

21. The method of claim 19 further comprising:

doping the gate electrode with boron.

22. The method of claim 19 wherein processing the silicon-containing material in a reactive ambient comprises rapid thermally nitridizing the silicon-containing material in an NH_3 ambient at a processing temperature of 700°C to 900°C.

23. A method for fabricating a semiconductor device comprising:

providing a substrate having at least one semiconductor layer;

cleaning the substrate by using hydrofluoric acid;

vapor depositing a silicon-containing material from a hexamethyldisilazane over at least a portion of the substrate;

forming a silicon-containing dielectric layer by rapid thermally nitridizing the deposited silicon-containing material in a nitridizing agent;

forming a second dielectric layer over the silicon-containing dielectric layer; and

forming an electrode over the second dielectric layer.

24. A method for fabricating a semiconductor device comprising:

providing a substrate having at least one semiconductor layer;

forming a first conductive layer over the substrate;

depositing a silicon-containing material over at least a portion of the substrate;

forming the dielectric layer by processing the deposited silicon-containing material with an oxidizing and nitridizing agent; and

forming a second conductive layer over the dielectric layer.

25. A method for fabricating a semiconductor device comprising:

providing a substrate having at least one semiconductor layer;

low temperature vapor depositing silicon-containing material from a hexamethyldisilazane source over at least a portion of a surface of the wafer such that the deposited silicon-containing material has a thickness of less than 20Å;

forming a silicon-nitride dielectric layer by rapid thermally nitridizing the deposited silicon-containing material in a NH_3 ambient;

forming a second dielectric layer over the silicon-nitride dielectric layer by low pressure chemical vapor depositing silicon nitride; and

forming a metal electrode over the second dielectric layer.